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Title

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Permalink

<https://escholarship.org/uc/item/87n6x09m>

Journal

Nature Sustainability, 3(3)

ISSN

2398-9629

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Publication Date

2020-03-01

DOI

10.1038/s41893-020-0477-x

Peer reviewed

How to halt the global decline of lands

The assessment of land degradation and restoration by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services shows that land degradation across the globe is a wide and severe issue and is showing no signs of slowing down. This trend must be halted and reversed.

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Land degradation is the persistent reduction in the capacity of the land to support human and other life on Earth¹. Human dominance of land and its natural resources has vastly increased over the past century and has substantially altered natural ecological processes on three-quarters of the Earth's land surface². That domination of the biosphere has contributed to increased human welfare, but the downside to humans and the environment is increasingly apparent. In every terrestrial and freshwater ecosystem type, to varying degrees, unsustainable land use and overexploitation of natural resources have impaired ecological function, capacity to supply ecosystem services, and the ability to support biodiversity¹. Populations of wild species have decreased and extinctions are occurring much more frequently than the rate at which new species naturally evolve³. Land degradation has negatively affected the living conditions of at least two-fifths of the people on Earth and it is estimated to be reducing global economic output by a tenth⁴. Vulnerable groups, indigenous and marginalized communities are disproportionately and negatively impacted, especially in terms of water supply and quality, health, and disaster vulnerability^{1,4}.

No easy political fix to land degradation

The findings of the land degradation and restoration assessment — and equally alarming evidence presented by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment and Intergovernmental Panel on Climate Change (IPCC) Special Report on Land, showing the interlinkages between land degradation, climate change and biodiversity loss — are not news to researchers or well-informed citizens. The IPBES assessment also provides evidence that land degradation is avoidable,

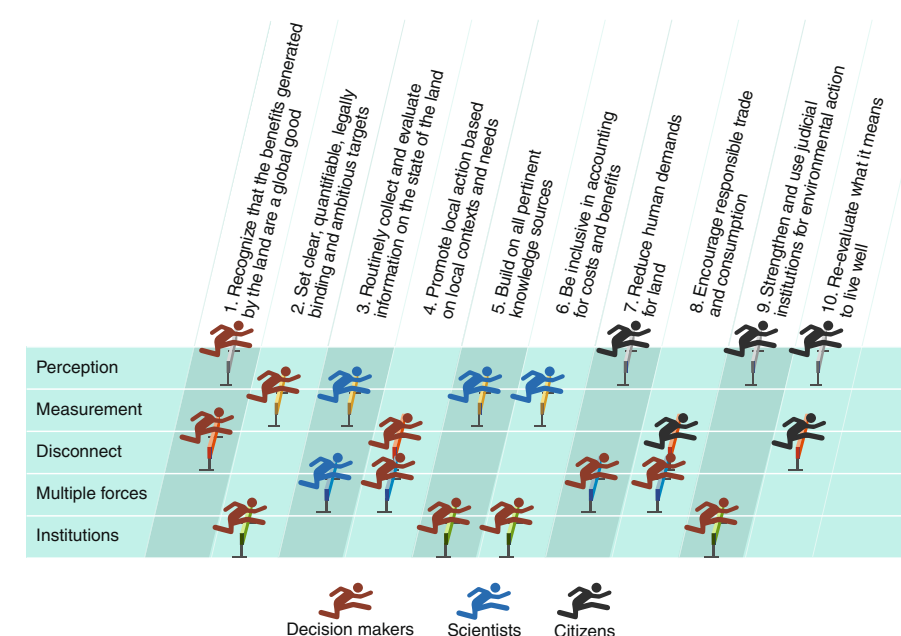


Fig. 1 | Ten strategies to overcome the five systemic barriers to urgent and sufficient action on protecting and restoring the land, and the leading actors for each. Credit: illustration by Yuka Otsuki Estrada.

and in many instances, reversible. Given that land degradation is typically local, visible and immediate, why has the issue failed to attract global attention in a similar way to climate change? Here are five systemic reasons.

First, land degradation is perceived radically differently by different people, depending on their worldview and relationship with land. To many individuals, human impacts on land and natural resources are inevitable, and indeed necessary, side-effects of human development. There is no sense of urgency about land degradation, particularly among those benefitting economically from land exploitation — and who are generally not the people suffering the most severe consequences of degradation,

at least in the short term. Second, there is little agreement on standardized ways of measuring land degradation, on what the baselines and desired states should be, and systematic global monitoring is currently not undertaken. Often, this results in inconsistent estimates of the extent and severity of degradation. Biodiversity conservation policy faces a similar barrier, which has led to a call for well-defined and measurable metrics to guide policy, akin to the 1.5–2 °C target in the global climate policy processes⁵. Third, a profound disconnect between causes and consequences makes the impact of land degradation invisible to many. The policies and consumer behaviours causing land degradation are frequently spatially or cognitively disconnected from their

outcomes. This disconnect is a result of the long distances between producers and consumers of foods, biofuels and other land and water commodities⁶. And it is also a result of the lags, often decade-long, between the decisions leading to land degradation¹. Thus, policy makers and consumers are unaware of, feel unaffected by, and not responsible for land degradation. Fourth, land degradation is driven by a multiplicity of interacting forces — natural, cultural, demographic, economic, educational, technological and political — that interact through time at local to global scales and are hard to tease apart. For example, think of the linkages between climate change, biodiversity loss, social stability, migration and economic development¹. The absence of simple cause-and-effect relationships makes the issue easy to dismiss. Fifth, limited institutional competencies and motivation have hampered necessary action. Patience, coordinated action, and the political will to change long-entrenched practices are needed but absent. Land protection policies are present in most countries but are frequently ignored, fragmented, contradictory, reactive or rigid. Indeed, few countries have a specific, competent environmental judicial body to enforce their national land protection legislation⁷.


Restoring the health of the land

The United Nations (UN) has announced 2021 as the start of the Decade on Ecosystem Restoration. Here are ten strategies to overcome the five systemic policy barriers, and thus transform the effectiveness of land protection and restoration. In Fig. 1 we show which groups are best positioned to have a leading role in these.

1. Recognize that the benefits generated by healthy and productive land are a global good. Since the causes and consequences of land degradation spill over national borders, land needs to be managed as a collective good based on agreements that minimize the adverse effects of land degradation on other nations. Increased transparency on the origin of the commodities linked to degradation can support global treaties to protect land as a limited planetary resource for future generations⁸.
2. Set clear, quantifiable, legally binding and ambitious targets to ensure that policies to halt and reverse land degradation match the scale and urgency of the problem. Currently, none of the global environmental conventions are legally binding. Aspirations to restore 15% of degraded ecosystems by 2020 will not be met¹. Sustainable Development Goal
3. Routinely collect and evaluate information on the state of the land. Prerequisites for credible information needed to guide effective decision making are the open sharing of data and libraries of proven land protection and restoration practices¹. Institutions at several scales, working closely with each other and with policy makers and land stewards, must develop standards, undertake systematic monitoring and facilitate access to data and tools. The successful example of the climate change community in defining and sharing 'essential climate variables'¹⁰ should be followed.
4. Promote local action to tackle land degradation based on local contexts and needs. Land degradation takes place locally, even when driven by larger-scale processes. As a result, it is spatially heterogeneous and context-sensitive. Local communities investing in avoiding and reducing degradation must see tangible and direct benefits on the lands they depend upon⁹. Eliminating the larger-scale perverse incentives that frequently cause degradation requires policy coordination across sectors and scales. Legislation that awards land property rights if the natural vegetation is cleared is an example of a still-existing perverse policy incentive.
5. Build on all pertinent knowledge sources, not exclusively on conventional science. Scientific understanding and local experience are both indispensable. Indigenous peoples and their spiritual and cultural interconnections with the land represent one of the oldest — and most demonstrably sustainable — forms of land stewardship. A quarter of the world's land surface is either managed or tenured by indigenous peoples, and this land is often managed sustainably¹¹. Governments, businesses and other actors need to recognize and support the institutions and actions of indigenous peoples, and involve them
6. Take into account all the substantive costs and benefits when making decisions that impact land. Land protection and restoration actions are often dismissed as being unaffordable, but when the monetary and non-monetary benefits are more inclusively evaluated, including the long-term costs of inaction, restoration investments are generally welfare-improving overall^{4,13}. Natural capital accounting can be used to systematically describe environmental, social and economic values of nature¹⁴.
7. Reduce human demands for services delivered by land to match the capacity of the land to supply those services sustainably. The growing human appropriation of natural resources, and its unintended consequences, has two drivers: growth in consumption per capita, and growth in human population. Reduced impact of individual consumption can be achieved by adopting lifestyles that use fewer land and water-demanding resources, and a shift to those that are produced more efficiently. An example is adopting a plant-rich rather than animal-rich diet. Other examples are the reduction of waste, extension of product life, re-use and recycling. Population growth has levelled off in many parts of the world, but it continues apace elsewhere. Accelerated transition to population stability everywhere will deliver significant and lasting environmental and social benefits¹⁵. It can be achieved through policies promoting gender equality, improved access to education, family planning and social welfare for ageing populations, and the re-evaluation of subsidies that stimulate population growth.
8. Encourage responsible trade and consumption. Efforts to inform citizens about the environmental and social consequences of their consumption choices have to date had limited impact. Internalizing the environmental costs into the price of final products would increase the competitiveness of sustainable modes of production relative to those leading to land degradation. Implementation of the 'polluter pays' principle at all scales of trade — those who degrade land either pay for its restoration, or, where this is impossible, pay for equivalent protection or restoration elsewhere — would help ensure that benefits and costs are more equitably shared and would stimulate sustainable intensification of land resources¹.

9. Strengthen judicial institutions for environmental action by citizens. Ambitious objectives and concepts are repeatedly stated but seldom followed by adequate action. Going to court increases the accountability of governments and businesses regarding the laws and international treaties they have endorsed. Citizens are increasingly using judicial power for environmental action¹. Two legal innovations will help: recognizing the rights of future generations; and the intrinsic right of nature to exist. Human rights, once derided as the ravings of a lunatic fringe, have become a cornerstone legal concept. It is conceivable that ecological rights may be regarded equally in future⁷.
10. Re-evaluate what it means to live well. A successful life is for many synonymous with increasing purchasing power, which encourages increasing levels of consumption. Alternative views exist, based on values such as solidarity and respect for nature¹⁶. They can provide a foundation for more sustainable relationships between humans and the land we rely on.

This has been a list of ‘what to do better’. ‘How to do it better’ is just as important. It is essential to recognize that land degradation is a widespread, yet fixable problem. Public and private sector decision makers, scientists and citizens all have a role to play in protecting and restoring land. Figure 1 shows the opportunities for strategic partnerships. Addressing the systemic barriers related to the measurement of land degradation is a feasible early step. There is a clear role for scientists in this regard. Other actions — particularly those related to changing people’s perception — will take

more time. Together these actions can make the UN Decade for Ecological Restoration a turning point, rather than a talking point. Much depends on it. 

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Published online: 10 February 2020

<https://doi.org/10.1038/s41893-020-0477-x>

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Acknowledgements

We thank the hundreds of people who volunteered their expertise in producing and reviewing the IPBES Land Degradation and Restoration Assessment. A full list of their names is presented in the Supplementary Information.

Competing interests

The authors declare no competing interests.

Additional information

Supplementary information is available for this paper at <https://doi.org/10.1038/s41893-020-0477-x>.